

## **VII. SAN CARLOS IRRIGATION AND DRAINAGE DISTRICT**

The San Carlos Irrigation and Drainage District (SCIDD) includes 50,000 acres of private and public lands of the San Carlos Irrigation Project. Waters of the Gila River for lands of the San Carlos Irrigation Project are diverted at the Ashurst-Hayden Diversion Dam on the Gila River about 10 miles east of Florence, as shown on Figure L-NIA-14. The San Carlos Project was authorized by an Act of Congress, commonly called the San Carlos Act. The organization of the San Carlos IDD was completed on July 16, 1928.

All facilities and works of the Project are in the name of the United States. These are divided into three parts: Joint Works, Indian Works, and District Works. The United States, through the Bureau of Indian Affairs, operates and maintains the Joint Works, which are those that are used jointly by the District and Indian parts of the Project. The Indian Works are those used solely for Indian Lands, and the District Works are those used only for District lands.

Total irrigable area in the district is 50,000 acres. According to 1995 district crop and acreage reports, the net acreage cropped was 37,513 acres. The 13-year average number of acres irrigated during 1983-95 was approximately 32,434 acres.

An apportionment of water is made to the irrigated lands early in each calendar year based upon the amount of stored and pumped water available at that time, reduced by the anticipated conveyance losses. As additional supply becomes available during the year, the apportionment is increased. Normal flow in the river system is additionally available to lands covered by the priority schedule during each 10-day delivery period.

The district per acre assessment covers repayment of construction costs and cost of operation and maintenance, and entitles each acre to two af per acre if available in a given year.

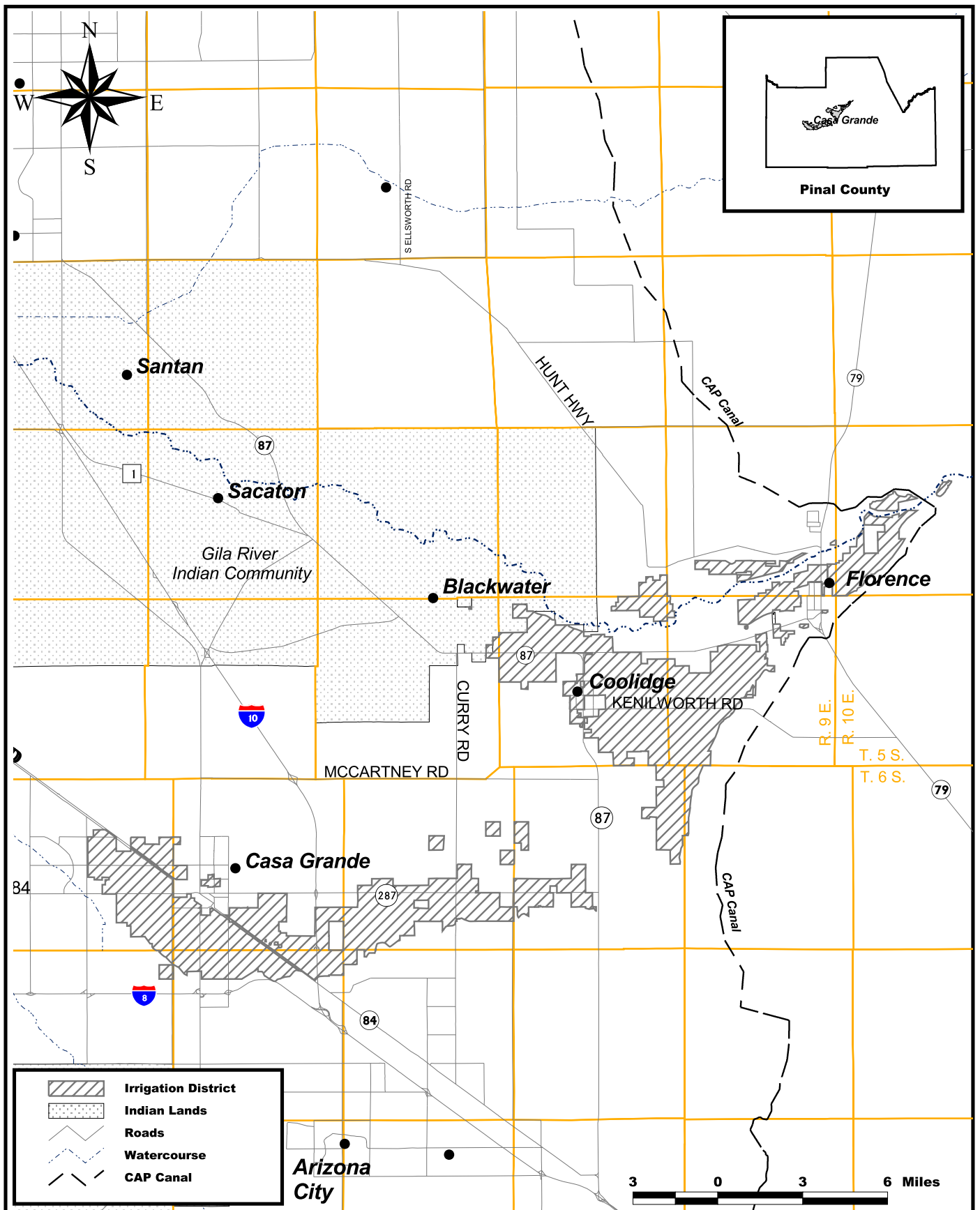
The 1936-1995 average quantity of water diverted to the district, from both pumped and gravity systems, was about 153,709 afa, and the quantity delivered to the lands was about 101,503 af or 66 percent of annual diversions.

In the San Carlos IDD service area in 1998, a total of 180,808 af of water was produced and delivered. Of that total, 92,683 af, or 51 percent, was from groundwater, 87,958 af, or 48 percent, was from Gila River water, and 167 af, or one percent, was from CAP.

### **VII.A. CAP Water Allocation History**

The San Carlos IDD has not entered into a subcontract with the United States and CAWCD for a CAP allocation, although it has expressed an interest in doing. For the purpose of this analysis, SCIDD's 1983 CAP allocation is treated as excess water.

Under Non-Settlement Alternative 3A, San Carlos IDD would be offered and would accept an allocation of the available NIA CAP water supply. For purposes of analysis only, this percentage amount has been converted to 8,284 afa. That CAP water would be delivered for a 50-year contract period (i.e., from 2001-2051) on an as-available basis, with less water anticipated as being available later in time. The CAP water would be used to supplement water supply demands over the next 50 years and would help reduce the continuing dependence on



June 2000

# **CAP Allocation Draft EIS** **General Location Map** **San Carlos Irrigation and Drainage District**

Figure #L-NIA-14

pumping groundwater from an overdrafted groundwater system. Under all the other alternatives, San Carlos IDD would not receive an additional allocation. Under the Settlement Alternative, SCIDD would receive 8.13 percent of the Ag Pool. Under all other alternatives, SCIDD would not receive a percentage of the Ag Pool. Table L-NIA-25 outlines the proposed CAP allocation by alternative.

<b>Table L-NIA-25</b> <b>CAP Allocation Draft EIS</b> <b>San Carlos IDD – Proposed Additional CAP Allocation</b>		
<b>Alternative</b>	<b>Additional Allocation<sup>a</sup> (in afa)</b>	<b>Priority</b>
Settlement Alternative	0	-
No Action	0	-
Non-Settlement Alternative 1	0	-
Non-Settlement Alternative 2	0	-
Non-Settlement Alternative 3A	8,284 <sup>b</sup>	NIA
Non-Settlement Alternative 3B	0	-
Existing CAP Allocation	16,276 <sup>c</sup>	NIA
<b>Notes:</b> <sup>a</sup> All NIA allocations are percentages of the available NIA CAP water supply. They are converted to fixed af amounts only for ease of calculation in the draft EIS. See Appendix B for the calculation of NIA allocation numbers. <sup>b</sup> This allocation is San Carlos IDD's calculated percentage from the uncontracted NIA pool. <sup>c</sup> Based on 4.09 percent of the available NIA CAP water supply. San Carlos IDD has not contracted for this CAP allocation.		

## VII.B. Water Demand and Supply Quantities

San Carlos IDD contains 50,000 total acres. No new acreage can be brought into production as a result of the 1980 GMA. Currently, San Carlos IDD uses approximately 2,175 afa of CAP water, which is Colorado River surplus water. Additionally, San Carlos IDD pumps 43,023 afa of groundwater. This water use pattern is based on a five-year average from 1998 to 1994. This water use pattern could change if acreage is taken out of production due to economic reasons or urbanization. Reductions in total water use reflect reductions in farmed acres due to water costs or the lack of access to CAP water.

In order to estimate impacts for the next fifty years, assumptions were made regarding the availability and pricing of CAP water for each alternative. These assumptions are fully described in Appendix A, Background Assumptions. Using the CAP water availability as a base, a model was developed (as described in Appendix D, Socioeconomic Analysis) to project water use and the number of cropped acres based on economic decisions. For example, the economic model predicts whether or not a certain wheat will be grown based on the marginal costs of growing wheat, given the prices and availability of water. The water uses projected by the economic model were incorporated into the groundwater model to verify San Carlos IDD's ability to pump and afford the projected groundwater use. Acreage was also decreased based on urbanization due to population growth.

**VII.C. Specific Construction-Related Impacts**

No new water delivery facilities would be required. However, under Non-Settlement Alternative 3A, it is assumed San Carlos IDD would be required to line its system in order to be eligible to receive CAP water. The lining of the Florence-Casa Grande Canal was described at the programmatic level in the EIS for the PMIP. However, supplemental NEPA and other environmental compliance would be required prior to the lining of the San Carlos IDD system.

**VII.D. Environmental Effects**

In addition to the impacts from lining its system, additional environmental impacts to San Carlos IDD would result from the availability of CAP water and its cost, under the different alternatives.

**VII.D.1. Land Use**

Table L-NIA-26 shows the land use pattern for years 2001 to 2051 within the San Carlos IDD area. Approximately 1,100 acres are projected to be urbanized over the study period. No land is projected to be retired and fallowed due to farm economics.

<b>Table L-NIA-26</b> <b>CAP Allocation Draft EIS</b> <b>San Carlos IDD – Projected Agricultural Land Use</b> <b>(Acres)</b>				
<b>Alternative</b>	<b>Year</b>	<b>Land Farmed</b>	<b>Land Urbanized Per Time Step</b>	<b>Land Fallowed Due to Economic Reasons per Time Step</b>
Settlement Alternative	2001	31,790	0	0
	2004	32,389	322	0
	2017	32,156	233	0
	2030	31,902	254	0
	2043	31,726	176	0
	2051	31,605	121	0
No Action	2001	31,790	0	0
	2004	32,389	322	0
	2017	32,156	233	0
	2030	31,902	254	0
	2043	31,726	176	0
	2051	31,605	121	0
Non-Settlement Alternative 1	2001	31,790	0	0
	2004	32,389	322	0
	2017	32,156	233	0
	2030	31,902	254	0
	2043	31,726	176	0
	2051	31,605	121	0
Non-Settlement Alternative 2	2001	31,790	0	0
	2004	32,389	322	0
	2017	32,156	233	0
	2030	31,902	254	0
	2043	31,726	176	0
	2051	31,605	121	0
Non-Settlement Alternative 3A	2001	31,790	0	0
	2004	32,389	322	0
	2017	32,156	233	0
	2030	31,902	254	0
	2043	31,726	176	0
	2051	31,605	121	0
Non-Settlement Alternative 3B	2001	31,790	0	0
	2004	32,389	322	0
	2017	32,156	233	0
	2030	31,902	254	0
	2043	31,726	176	0
	2051	31,605	121	0

### **VII.D.2. Archaeological Resources**

Much of the project area has been surveyed, and numerous sites are documented within entity boundaries. The Casa Grande Ruins National Monument, an area of high cultural resource sensitivity, extends onto the northwest portion of the entity just north of Coolidge City limits. This extensive Hohokam site complex—which includes the Casa Grande Site, the Grewe Site, and other National Register-eligible properties—contains habitations, mounds, canals, a ball court, and cremation areas. It is likely that associated cultural remains (e.g., artifact scatters, agricultural features) could be present in the surrounding moderate-sensitivity areas. Several additional prehistoric properties in the vicinity have been recommended for inclusion on the National or State Historic Register, including Adamsville Ruin, Poston Butte, and the Blackwater Archaeological District. Other resource types that might be expected to occur within this entity's boundaries include protohistoric Pima sites, historic farmsteads, irrigation features, roads, and features associated with the Phoenix & Eastern, the Southern Pacific, and other early railroad routes. For information on the local historic preservation program, contact Ms. Jan Petersons. Cultural resource sensitivity areas in this entity are shown in Figure L-NIA-15. Based on the limited data used to generate the cultural sensitivity designations, the potential for cultural resource impacts in this entity is high to moderate. Urbanization of farmlands could impact any intact cultural/deposits that might be preserved below the plow zone. Mitigation for these potential impacts would be determined by local jurisdictions. No impacts to cultural resources are expected from land fallowing.

### **VII.D.3. Biological Resources**

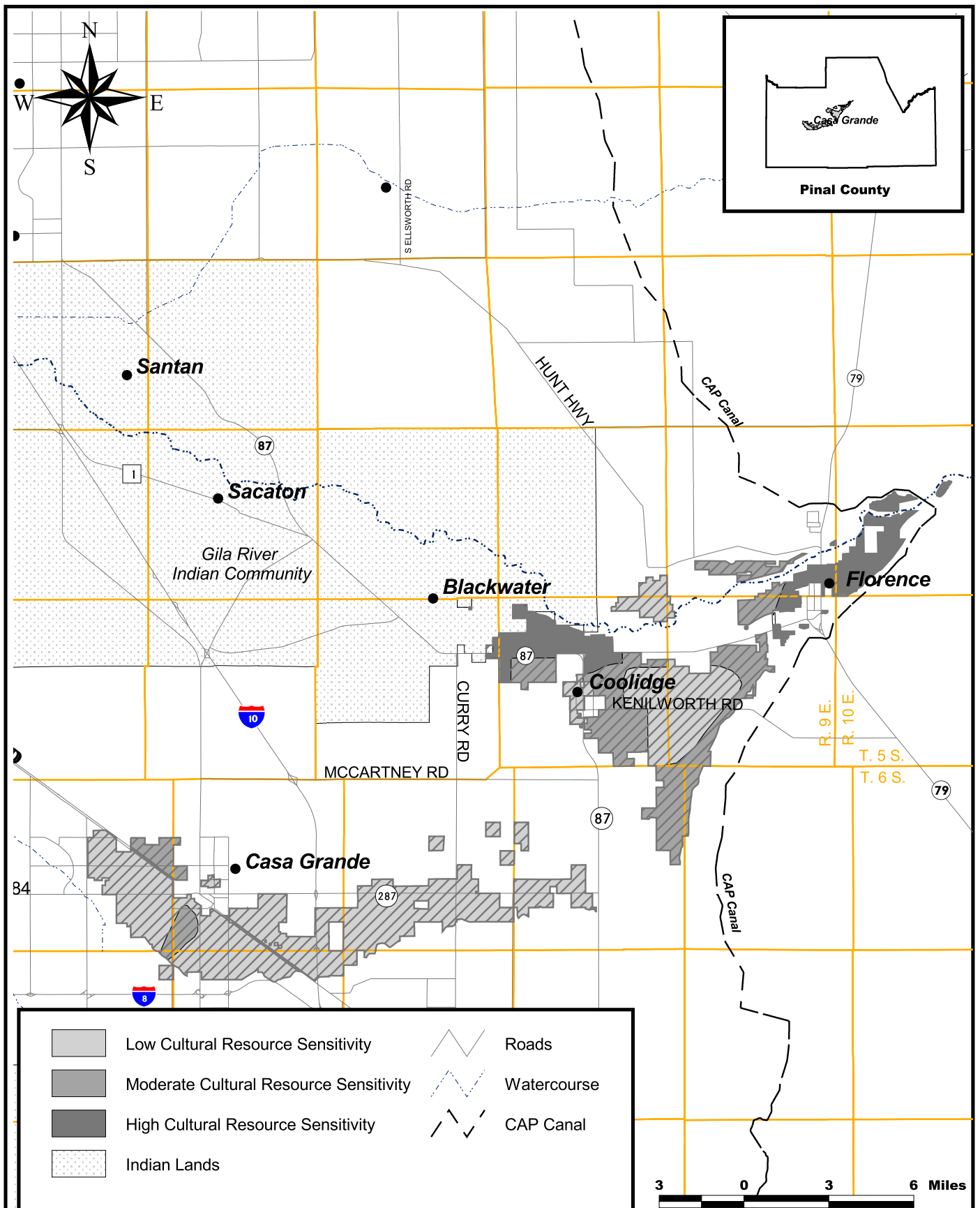
Table L-NIA-26 shows land use over the period of study by alternative. Land stays in agricultural production or is converted to urban uses. When conversion of agricultural lands to urban use occurs, loss of natural habitat or wildlife is minimal. However, adjacent lands may contain wildlife that might be impacted such as burrowing owls, nests of local birds, and habitat for small mammals.

### **VII.D.4. Water Resources**

SCIDD has met historical irrigation demands primarily using groundwater and Gila River water. Groundwater levels have declined historically in response to the groundwater pumping. The TDS concentration of groundwater ranges generally from about 500 to 1,000 ppm, but higher TDS concentrations occur in some areas. Parts of SCIDD have experienced subsidence historically, due to the groundwater level declines.

Presented in Table L-NIA-27 are estimated changes in groundwater levels from 2001 to 2051. Estimated groundwater level impacts for each alternative (changes from levels under the No Action Alternative) are also shown. Groundwater conditions were estimated in the analysis for three areas that include lands in SCIDD. Three values are presented in Table L-M&I-109 for each alternative, representing groundwater levels for (in order) the western, central, and eastern parts of SCIDD. Estimated groundwater level changes are largest in the central part of SCIDD and smallest in the western part of SCIDD.

Under the No Action Alternative, groundwater levels would decline from 2001 to 2051, reflecting the continued reliance on groundwater both in SCIDD and in adjacent areas. The



June 2000

# **CAP Allocation Draft EIS** **Cultural Resources** **San Carlos Irrigation and Drainage District**

Figure #L-NIA-15

lower groundwater levels would cause an increase in groundwater pumping costs, and a continuation of the subsidence that has been historically experienced. Lower groundwater levels might also result in production of poorer quality groundwater at some wells in SCIDD where there is poorer quality water at depth.

Groundwater levels under the Settlement Alternative and all Non-Settlement Alternatives would also decline by year 2051. While groundwater levels would decline for the Settlement Alternative, the decline would be as much as 29 feet less than under the No Action Alternative. The smaller decline reflects that SCIDD would receive water from the Ag Pool under the Settlement Alternative. For the Non-Settlement Alternatives, SCIDD would not receive CAP water, and groundwater levels would generally be slightly deeper than under the No Action Alternative. Substantial changes in groundwater quality and subsidence would not be anticipated for the Settlement and Non-Settlement Alternatives.

<b>Table L-NIA-27</b> <b>CAP Allocation Draft EIS</b> <b>San Carlos IDD – Groundwater Data Table</b>		
<b>Alternative</b>	<b>San Carlos IDD*</b>	
	<b>Estimated Groundwater Level Change from 2001-2051 (in feet)</b>	<b>Groundwater Level Impact** (in feet)</b>
No Action	-27/-77/-67	--
Settlement Alternative	-11/-48/-58	16/29/9
Non-Settlement Alternative 1	-31/-77/-67	-4/0/0
Non-Settlement Alternative 2	-38/-79/-68	-11/-2/-1
Non-Settlement Alternative 3A	-38/-79/-66	-11/-2/-1
Non-Settlement Alternative 3B	-39/-83/-73	-12/-6/-7
* Values correspond to the SCIDD, HIDD/SCIDD, and Casa Grande sub-areas, respectively. ** Computed by subtracting the estimated groundwater decline from 2001 to 2051 for the No Action Alternative from the estimated change in groundwater level for the same period for the alternative under consideration. The estimated impact is considered to be more accurate than the estimated decline in groundwater levels.		

#### **VII.D.5. Socioeconomic**

SCIDD was not included in the economic analysis because no change in output associated with water price is projected to occur. Groundwater pumping costs in SCIDD are sufficiently low so that farmers' total water costs do not become too costly for the cultivation of certain crops even when availability of CAP excess water declines. Therefore, no socioeconomic impacts associated with the CAP reallocation strategies analyzed in this EIS were analyzed for this district.